The Threshold Effects of Monetary Policy Rate on Credit Expansion in Nigeria

George-Anokwuru, Chioma Chidinma
Department of Economics, Faculty of Social Sciences, University of Port Harcourt, Nigeria
chiomanwoga@yahoo.com

Abstract
This study investigated the threshold effects of the Monetary Policy Rate - MPR on credit expansion in Nigeria using annual data from 1981 to 2023. While existing studies have largely examined the linear relationship between monetary policy and credit expansion, little attention has been paid to whether the impact of monetary policy rate changes once it crosses a critical level. To address this gap, the study employed Hansen's (1999, 2000) Discrete Threshold Regression Model, with credit expansion proxied by private sector credit as a ratio of gross domestic product in %, while of broad money supply as a ratio of gross domestic product in %, exchange rate, and inflation were included as control variables. The empirical results identified an estimated MPR threshold of 13%, indicating the existence of two distinct monetary policy regimes. The findings revealed that the direct effect of the MPR on credit expansion is statistically insignificant in both the low rate (MPR < 13%) and high rate (MPR ≥ 13%) regimes, although the coefficient changes from negative below the threshold to positive above it. In contrast, broad money supply exerts a positive and statistically significant influence on credit expansion in both regimes, with a stronger effect observed when the MPR is below the estimated threshold. Exchange rate and inflation are found to have statistically insignificant effects on credit expansion across both regimes. The study concluded that liquidity conditions, rather than changes in the policy rate alone, constitute the primary channel through which monetary policy influences credit expansion in Nigeria. The study therefore recommended among others that the apex bank in Nigeria should complement monetary policy rate adjustments with effective liquidity management measures and consider the estimated 13% MPR threshold as an analytical reference point when formulating monetary policy. The study contributed to the literature by providing current empirical estimate of an MPR threshold for credit expansion in Nigeria using Hansen's threshold regression framework, thereby offering new evidence on the nonlinear nature of monetary policy transmission in Nigeria.

Keywords: Monetary Policy Rate, Credit Expansion, Threshold Regression, Monetary Policy Threshold, Nigeria.

1. Introduction

Monetary policy occupies an essential position in the management of the economy because it provides the principal mechanism through which central banks influence economic activity, keep prices stable, control financial markets, and help the economy grow in a sustainable way. Through the manipulation of policy interest rates, reserve requirements, liquidity ratios, and open market operations, monetary authorities influence the availability and cost of money within the financial system, thereby affecting consumption, investment, employment, and output (Mishkin, 2022). In developing economies such as Nigeria, where financial markets remain predominantly bank-based, how well monetary policy works depends on how effectively it can control the amount and type of loans given to businesses (Bernanke & Gertler, 1995).

The banking sector serves as the primary intermediary between savers and investors, making bank credit an indispensable source of finance for businesses, households, and government activities. Credit expansion enables firms to acquire productive assets, finance working capital, adopt new technologies, and expand production capacity, while households rely on credit to finance housing, education, and durable goods consumption (Arestis & Sawyer, 2006). Accordingly, sustained credit expansion is widely regarded as an essential driver of investment, employment creation, productivity growth, and long-term economic development. Conversely, a persistent contraction in bank lending may suppress aggregate demand, discourage private investment, and weaken overall economic performance.

Monetary policy's ability to encourage or limit the creation of credit mainly works through interest rates and the way banks lend money. Bernanke and Gertler (1995) explained that monetary policy affects the economy not just by changing interest rates but also by influencing banks' financial health and their ability to give loans. When there's tighter monetary policy, banks have less money and are less able to lend, which makes borrowing more expensive and discourages investment. On the other hand, when monetary policy is looser, borrowing becomes cheaper, banks have more money, and they are more willing to lend, which leads to more credit being created. This process is especially important in developing countries where banks are the main way people get money and other sources of funding are not well developed.

In Nigeria, monetary policy has undergone significant transformations since the implementation of the Structural Adjustment Programme (SAP) in 1986. Prior to financial liberalization, monetary policy relied heavily on direct controls, including credit ceilings, sectoral credit allocation, and administered interest rates. However, financial sector reforms introduced indirect monetary policy instruments based on market mechanisms, allowing the Central Bank of Nigeria (CBN) to influence economic activity primarily through the Monetary Policy Rate (MPR), Open Market Operations (OMO), the Cash Reserve Ratio (CRR), and the Liquidity Ratio (LR) (CBN, 2024). Among these instruments, the MPR has emerged as the principal benchmark rate guiding the pricing of loans, deposits, and other financial assets.

The conduct of monetary policy in Nigeria has become increasingly challenging due to recurring macroeconomic shocks, including high inflation, exchange rate volatility, declining oil revenues, fiscal imbalances, and external financial disturbances. Inflationary pressures have remained persistently elevated in recent years, compelling the CBN to adopt a series of contractionary monetary policy measures aimed at restoring price stability. Between 2022 and 2025, the monetary policy rate was increased repeatedly in response to accelerating inflation and depreciation of the domestic currency (CBN, 2024). For instance, monetary policy rate stood at 16.5% by the end of 2022. In 2023, monetary policy rate was increased to 18.75%. The apex bank continued to raise the benchmark rate through 2024, eventually hitting 27.25% in September, 2024, with further adjustments bringing the rate to 27.0% by September, 2025. In July, 2026, the apex bank fixed monetary policy rate at 26.5 per cent (CBN, 2026). Although these policy actions were intended to stabilize the macroeconomic environment, they simultaneously raised commercial lending rates and intensified concerns regarding declining credit availability to the private sector.

The relationship between monetary policy and credit expansion has attracted considerable attention in both theoretical and empirical literature. Traditional Keynesian and monetarist frameworks generally assume a straight-line (linear) relationship between monetary policy rate and credit expansion. This means that when interest rate set by the apex bank goes up, borrowing costs, investments, and credit growth change in a matching way. According to Mishkin (2022), raising the policy rate is thought to cut credit growth by the same amount each time, no matter what the overall economic situation is. While this makes analysis easier, it might not show the

full picture of financial systems, which often have fixed parts, unequal information, and different reactions from different financial institutions.

Increasingly, contemporary macroeconomic literature suggests that the effects of monetary policy are nonlinear and may vary substantially depending on prevailing economic conditions. In particular, the responsiveness of banks and borrowers to policy changes may differ once policy interest rates exceed certain critical levels or thresholds. Moderate increases in policy rates may exert only marginal effects on lending when financing costs remain manageable. However, beyond a critical threshold, further increases may significantly discourage loan demand, increase credit risk, reduce banks' willingness to lend, and amplify financial constraints faced by firms and households (Hansen, 1999; Kremer, Bick & Nautz, 2013). Such nonlinear relationships imply that the effectiveness of monetary policy depends not only on the direction of policy changes but also on the prevailing monetary policy regime.

Threshold effects have become a key topic in macroeconomics because they show that economic relationships can change when certain important variables reach specific points. Hansen (1999, 2000) created a framework called threshold regression to find these key points and look at how different factors affect the economy in different situations. Since then, this method has been used in many studies looking at issues like inflation, economic growth, public debt, financial development, exchange rates, and fiscal policy (Khan & Senhadji, 2001). But not many studies have used this approach to examine how monetary policy affects bank credit, especially in developing countries like Nigeria.

Existing empirical evidence on monetary policy and credit expansion in Nigeria remains inconclusive. Several studies report that higher policy interest rates significantly reduce commercial bank lending by increasing borrowing costs and tightening liquidity conditions (Nwosa & Saibu, 2012; Omankhanlen, 2014). Other studies, however, find weak or statistically insignificant relationships between monetary policy variables and private sector credit, suggesting that structural characteristics of the Nigerian financial system may weaken the monetary transmission mechanism (Acha, 2011). These conflicting findings may partly reflect differences in model specification, estimation techniques, sample periods, and variable measurement. More importantly, most previous studies have relied on conventional linear econometric approaches such as Ordinary Least Squares (OLS), Vector Autoregression (VAR),

Vector Error Correction Models (VECM), and Autoregressive Distributed Lag (ARDL) models (Acha, 2011; Nwosa & Saibu, 2012; Omankhanlen, 2014). These models implicitly assume that changes in monetary policy rate produce constant marginal effects irrespective of the prevailing level of policy interest rates. Such an assumption may mask important nonlinear dynamics within the monetary transmission mechanism.

Despite growing international interest in threshold analysis, empirical studies estimating monetary policy thresholds for Nigeria remain scarce. Existing Nigerian studies have focused primarily on the linear effects of monetary policy on inflation, economic growth, exchange rates, or financial development, with limited attention to nonlinear credit responses. As a result, policymakers lack empirical evidence regarding the level of policy rates beyond which further monetary tightening becomes counterproductive by excessively constraining bank lending. This represents an important gap in both the Nigerian and broader African monetary policy literature. The absence of threshold-based evidence creates an important gap in Nigeria's monetary policy literature. Without identifying the critical Monetary Policy Rate that maximizes macroeconomic stability while sustaining credit expansion, monetary authorities may inadvertently maintain policy rates that impose unnecessary constraints on investment and economic growth. This knowledge gap is particularly important given Nigeria's ongoing efforts to stimulate private-sector-led growth while simultaneously addressing inflation and exchange rate volatility.

Therefore, this study bridged this gap by estimating the threshold effects of monetary policy Rate on credit expansion in Nigeria. Specifically, the study employed Hansen's (1999, 2000) Threshold Regression framework to determine whether a critical Monetary Policy Rate exists and to examine how the effects of monetary policy differ below and above this threshold. The findings are expected to provide evidence-based guidance for designing monetary policies that achieve price stability without undermining financial intermediation and sustainable economic growth. The rest of the paper was organized into sections that included literature review, materials and methods, results and discussion, conclusion, and recommendations.

2. Literature Review

Conceptual Clarification

Monetary Policy

Monetary policy refers to the deliberate actions undertaken by a country's central bank to regulate the supply of money, the cost of credit, and overall financial conditions in order to achieve macroeconomic objectives such as price stability, full employment, sustainable economic growth, exchange rate stability, and financial system stability (Mishkin, 2022). Supporting the above, George-Anokwuru (2023) explained that monetary policy involves steps taken by monetary authorities to control how much money is available, how expensive it is to borrow, how easy it is to get credit, and where that money and credit go. Basically, it's a planned effort by the monetary authorities to influence the money supply and credit conditions in order to meet certain important economic goals.

Through monetary policy, central banks influence aggregate demand by controlling liquidity conditions and the availability of credit within the economy. The classical monetarist school, led by Friedman (1968), argues that changes in the money supply constitute the primary determinant of inflation and economic activity. According to this view, maintaining stable growth in money supply is essential for achieving long-run macroeconomic stability. Keynesian economists, however, emphasize the importance of interest rates as the principal transmission mechanism through which monetary policy influences investment, consumption, and aggregate demand (Keynes, 1936). Contemporary monetary economics combines these perspectives by recognizing multiple transmission channels, including the interest rate channel, exchange rate channel, asset price channel, expectations channel, and bank lending (credit) channel (Mishkin, 2022).

In Nigeria, the Central Bank of Nigeria (CBN) is constitutionally mandated under the Central Bank of Nigeria Act, 2007 to formulate and implement monetary policy. The CBN's primary objective is to maintain monetary and price stability while promoting a sound financial system that supports sustainable economic development (CBN, 2024). Since the financial liberalization reforms introduced under the Structural Adjustment Programme (SAP) in 1986, Nigeria has progressively shifted from direct monetary controls such as credit ceilings and administered interest rates to market-based monetary policy instruments.

The principal monetary policy instruments currently employed by the CBN include the Monetary Policy Rate (MPR), Open Market Operations (OMO), the Cash Reserve Ratio (CRR), the Liquidity Ratio (LR), and moral suasion (CBN, 2024). Among these instruments, the Monetary Policy Rate serves as the benchmark policy interest rate that influences lending rates, deposit rates, treasury bill yields, and other money market rates. Changes in the MPR signal the monetary policy stance of the central bank and influence the behavior of financial institutions and economic agents.

Monetary policy may be either expansionary or contractionary. Expansionary monetary policy seeks to increase liquidity, lower borrowing costs, and stimulate investment and economic activity through reductions in policy interest rates or increases in money supply. Conversely, contractionary monetary policy aims to reduce inflationary pressures by increasing policy rates, restricting liquidity, and moderating aggregate demand (Mishkin, 2022). The effectiveness of either stance depends on the strength of the monetary transmission mechanism and the responsiveness of financial markets and borrowers.

Recent developments in Nigeria have underscored the growing importance of monetary policy in macroeconomic management. Rising inflation, exchange rate volatility, fiscal pressures, and external shocks have prompted the CBN to adopt a more restrictive monetary policy stance, leading to successive increases in the Monetary Policy Rate. While these measures are intended to restore macroeconomic stability, they also raise concerns regarding their implications for credit availability, investment, and private-sector growth.

Credit Expansion

Credit expansion refers to the increase in the quantity of loans and advances supplied by financial institutions to households, businesses, and other economic agents over a given period. It reflects the extent to which the financial system mobilizes savings and channels them toward productive investment and consumption activities (Levine, 2005). In macroeconomic analysis, credit expansion is widely regarded as a key indicator of financial development because it measures the ability of financial institutions to perform their intermediary functions effectively. The banking system occupies a central position in credit creation through the fractional reserve banking process. Deposit money banks receive deposits from surplus economic units and extend

loans to deficit units, thereby creating additional purchasing power within the economy. As credit expands, firms acquire resources to finance capital investment, technological innovation, inventory accumulation, and business expansion, while households obtain financing for housing, education, and consumer expenditure. Consequently, credit expansion stimulates aggregate demand, employment, productivity, and economic growth (Arestis & Sawyer, 2006).

Within the Nigerian context, private sector credit represents one of the most important indicators of financial intermediation because the private sector accounts for the majority of productive economic activities. Increased access to bank credit enables firms to expand production, invest in fixed capital, and generate employment. Conversely, inadequate credit availability constrains entrepreneurship, limits industrial development, and slows economic diversification. Credit expansion is influenced by several macroeconomic and institutional factors. These include monetary policy, lending interest rates, inflation, exchange rate movements, financial sector development, banking sector capitalization, liquidity conditions, and borrower creditworthiness (Bernanke & Gertler, 1995). Among these determinants, monetary policy occupies a particularly significant role because it directly influences banks' cost of funds and lending behavior.

Empirically, credit expansion is commonly measured using domestic credit to the private sector expressed either as a percentage of Gross Domestic Product (GDP) or in real monetary terms. The World Bank (2024) defines domestic credit to the private sector as financial resources provided to the private sector by financial corporations through loans, purchases of non-equity securities, trade credits, and other accounts receivable. This measure captures the degree to which financial institutions support private-sector economic activities. Although credit expansion generally promotes economic growth, excessive or poorly regulated credit growth may also generate financial instability. Rapid credit expansion can encourage speculative investment, increase non-performing loans, and heighten systemic financial risks if not accompanied by prudent lending standards (Cecchetti & Kharroubi, 2012). Consequently, central banks must strike an appropriate balance between encouraging productive lending and maintaining financial stability.

Monetary Policy and Credit Expansion

The association between monetary policy and credit expansion constitutes one of the most important channels through which central banks influence macroeconomic performance. The bank lending or credit channel suggests that monetary policy affects the quantity of loans supplied by financial institutions through changes in reserves, liquidity, and funding costs (Bernanke & Gertler, 1995). Under this mechanism, monetary tightening reduces bank reserves, increases funding costs, and constrains lending, while monetary easing enhances liquidity and encourages credit creation.

Changes in the monetary policy rate influence commercial banks through several mechanisms. First, increases in the policy rate raise the cost of obtaining reserves and wholesale funding, leading banks to increase lending rates. Higher lending rates reduce loan demand as firms postpone investment projects and households delay consumption financed by borrowing. Second, tighter monetary policy may reduce banks' balance-sheet strength by increasing loan defaults and weakening collateral values, thereby reducing banks' willingness to extend additional credit. Third, persistent monetary tightening may increase uncertainty regarding future economic conditions, further discouraging lending.

The effectiveness of monetary policy in influencing credit expansion depends on the structure of the financial system. In bank-based economies such as Nigeria, where alternative sources of finance remain limited, the credit channel tends to play a more prominent role than in market-based financial systems. Consequently, changes in monetary policy have potentially significant implications for investment, employment, and economic growth. However, the relationship between monetary policy and credit expansion may not always be proportional. During periods of abundant liquidity, moderate increases in policy rates may exert relatively small effects on lending because banks possess sufficient reserves to accommodate loan demand. Conversely, during periods of financial stress or elevated interest rates, similar policy adjustments may produce much larger reductions in credit supply. These observations suggest that monetary policy effects may be nonlinear.

Monetary Policy Threshold

The concept of a monetary policy threshold originates from the broader theory of nonlinear macroeconomic relationships. A threshold refers to a critical value of an explanatory variable beyond which the magnitude or direction of its impact on another variable changes significantly (Hansen, 1999). In the context of monetary policy, the threshold represents the level of the Monetary Policy Rate at which the relationship between policy actions and credit expansion shifts from one regime to another. Threshold effects recognize that economic agents often respond differently under varying policy environments. For example, an increase in the policy rate from 10% to 11% may have only a modest impact on borrowing decisions, whereas an increase from 24% to 25% may substantially reduce loan demand and increase credit rationing because borrowing costs become prohibitively expensive. Consequently, the marginal effect of monetary policy is unlikely to remain constant across all interest-rate levels.

Threshold analysis therefore divides observations into different regimes according to whether the threshold variable lies below or above an estimated critical value. Hansen (1999, 2000) developed an econometric framework for estimating such thresholds endogenously rather than imposing arbitrary policy cut-off points. This methodology allows researchers to identify the policy rate at which structural changes occur in the relationship between monetary policy and credit expansion.

For monetary authorities, identifying threshold values is particularly valuable because it enables the design of more effective policy strategies. If the Monetary Policy Rate exceeds its optimal threshold, further increases may impose disproportionately large costs on investment and credit creation while yielding only limited additional reductions in inflation. Conversely, maintaining the policy rate below the threshold may preserve financial intermediation while still supporting macroeconomic stability. Despite the increasing application of threshold models in studies of inflation, economic growth, and public debt, empirical investigations of monetary policy thresholds remain limited in many developing economies, including Nigeria. This study addresses that gap by estimating the threshold level of the Monetary Policy Rate beyond which monetary tightening significantly alters credit expansion.

Theoretical Review

The theoretical framework provides the analytical foundation for understanding the relationship between monetary policy and credit expansion. Several theories explain how monetary policy affects financial intermediation and lending behaviour. This study reviews four major theories: the Keynesian liquidity preference theory**,** the monetarist theory of monetary policy, the credit channel theory, and the threshold regression theory. The study is principally anchored on the credit channel theory because it directly explains the mechanism through which monetary policy influences bank lending and credit expansion.

Keynesian Liquidity Preference Theory

The Keynesian liquidity preference theory was developed by Keynes (1936) in *The General Theory of Employment, Interest and Money*. The theory elucidates how interest rates are determined by the interaction between the demand for money and supply of money. According to Keynes, individuals hold money for three principal motives: the transaction motive, the precautionary motive, and the speculative motive. The transaction motive reflects the need to finance routine purchases of goods and services, the precautionary motive arises from uncertainty regarding future expenditures, while the speculative motive reflects expectations about future movements in interest rates and bond prices. Within this framework, the central bank influences interest rates by adjusting the money supply. An expansionary monetary policy increases the money supply, reduces interest rates, lowers the cost of borrowing, and stimulates investment and aggregate demand. Conversely, contractionary monetary policy reduces money supply, raises interest rates, discourages investment, and slows economic activity (Mishkin, 2022).

The theory highlights the importance of interest rates as the principal channel through which monetary policy affects investment and output. Since investment decisions are highly sensitive to borrowing costs, changes in policy rates influence firms' willingness to undertake new capital projects. Consequently, monetary policy indirectly affects economic growth through its impact on investment expenditure. Although the liquidity preference theory provides an important explanation of monetary transmission, its application to modern banking systems is limited because it assumes that monetary policy operates primarily through interest rates.

Contemporary financial systems reveal that monetary policy also influences banks' balance sheets, liquidity positions, and lending behaviour independently of market interest rates (Bernanke & Gertler, 1995). Consequently, the theory does not fully capture the role of financial intermediaries in the monetary transmission process.

Monetarist Theory of Monetary Policy

The monetarist theory is closely associated with Friedman (1968), who argued that changes in the money supply constitute the primary determinant of inflation, output, and macroeconomic stability. According to the monetarist school, inflation is fundamentally a monetary phenomenon arising from excessive growth in the money supply relative to real output. The theory maintains that central banks should focus on controlling money supply growth rather than attempting to fine-tune economic activity through discretionary interest rate adjustments. Friedman (1968) argued that stable and predictable monetary expansion promotes long-run price stability while minimizing economic fluctuations. Excessive monetary growth, however, generates inflationary pressures, whereas insufficient monetary growth may induce recession and unemployment. Within the monetarist framework, monetary policy influences credit expansion by altering the quantity of loanable funds available within the banking system. An increase in money supply enhances bank reserves, increases liquidity, and expands lending capacity. Conversely, monetary contraction reduces reserves and limits banks' ability to create new loans.
The monetarist theory remains highly influential in monetary economics because it emphasizes the importance of controlling inflation through prudent monetary management. Nevertheless, critics argue that the theory overemphasizes money supply while underestimating the role of financial institutions, credit market imperfections, and expectations in determining monetary policy outcomes (Mishkin, 2022). Furthermore, financial innovation has weakened the stability of money demand, reducing the effectiveness of monetary aggregates as policy targets. Despite these criticisms, the theory provides useful insights into the relationship between monetary policy and credit creation by highlighting the role of liquidity conditions within the banking system.

Credit Channel Theory

The credit channel theory, developed by Bernanke and Gertler (1995), extends the traditional monetary transmission mechanism by emphasizing the role of financial intermediaries in transmitting monetary policy to the real economy. Unlike conventional theories that focus solely on interest rates, the credit channel theory argues that monetary policy also influences economic activity through changes in banks' lending capacity and borrowers' access to external finance. The theory identifies two complementary transmission mechanisms: the bank lending channel and the balance sheet channel. The bank lending channel argues that contractionary monetary policy reduces commercial banks' reserves and deposits, thereby limiting their ability to extend loans. Since many borrowers particularly small and medium-sized enterprises (SMEs) depend heavily on bank financing, reduced loan availability suppresses investment, production, and employment. Conversely, expansionary monetary policy increases bank reserves and enhances lending capacity, thereby stimulating economic activity.

The balance sheet channel focuses on borrowers rather than banks. Higher interest rates reduce firms' net worth by lowering asset values and increasing debt servicing costs. Weaker balance sheets increase the external finance premium because lenders perceive greater default risk. Consequently, borrowers experience more stringent credit constraints even if banks possess adequate liquidity. The credit channel theory is particularly relevant to developing economies such as Nigeria because commercial banks remain the dominant providers of external finance. Capital markets remain relatively underdeveloped, making firms highly dependent on bank credit for investment financing. Changes in the monetary policy rate therefore have substantial implications for the availability and affordability of credit.

Furthermore, the theory accommodates the possibility that monetary policy effects vary across different economic conditions. During periods of financial stress, high interest rates, or declining asset prices, the contractionary effects of monetary policy may become considerably stronger. This characteristic aligns closely with the threshold approach adopted in the present study, where the impact of monetary policy is expected to differ once the Monetary Policy Rate exceeds a critical value. Empirical studies generally provide strong support for the Credit Channel Theory. Bernanke and Gertler (1995) demonstrated that monetary policy significantly affects bank lending independently of changes in market interest rates. Subsequent studies by

Kashyap and Stein (2000) and Gambacorta and Shin (2018) further confirmed the importance of bank balance sheets and capital positions in determining the effectiveness of monetary policy transmission.

Threshold Regression Theory

Threshold regression theory was formally developed by Hansen (1999, 2000) to address situations in which relationships between variables change once an explanatory variable crosses an unknown critical value. Unlike conventional linear regression models that estimate constant coefficients, threshold regression permits coefficients to differ across distinct regimes defined by an endogenous threshold. The basic proposition of the theory is that many economic relationships are inherently nonlinear. Consequently, policy variables may exert different effects depending on whether they lie below or above a critical threshold. Hansen (1999) proposed estimation procedures that identify threshold values directly from the data using least squares methods and bootstrap techniques for statistical inference.

Threshold models have become increasingly important in macroeconomics because they capture structural changes and regime dependent behaviour that conventional linear models cannot explain adequately. Applications include studies of inflation and economic growth (Khan & Senhadji, 2001), public debt sustainability, exchange rate pass-through, financial development, and fiscal policy. Applied to the present study, Threshold Regression Theory suggests that increases in the monetary policy rate may produce relatively small reductions in credit expansion when interest rates remain below a critical level. However, once the policy rate exceeds the estimated threshold, additional increases may generate disproportionately larger contractions in bank lending owing to higher financing costs, increased default risks, and greater credit rationing. This theoretical framework therefore provides the econometric justification for estimating an endogenous monetary policy rate threshold rather than assuming a constant linear relationship between monetary policy and credit expansion.

Justification for the Underpinning Theory

Although each of the theories reviewed contributes to understanding the relationship between monetary policy and economic activity, the credit channel theory provides the most appropriate

theoretical foundation for this study. The liquidity preference theory emphasizes interest rates as the principal transmission mechanism but pays limited attention to banks' lending behaviour. Similarly, the monetarist theory focuses primarily on money supply growth and aggregate liquidity while overlooking financial frictions that characterize modern banking systems. In contrast, the credit channel theory explicitly explains how monetary policy affects credit creation through changes in banks' balance sheets, lending capacity, and borrowers' access to external finance. Since this study investigates the effect of monetary policy on credit expansion, rather than on output or inflation directly, the credit channel theory provides the most relevant conceptual framework. Moreover, the theory is highly applicable to Nigeria because the financial system remains predominantly bank-based, with commercial banks serving as the principal source of external finance for businesses and households. Changes in the monetary policy rate therefore directly influence lending behaviour and the availability of credit to the private sector. Finally, the credit channel theory complements the threshold regression theory adopted in the empirical analysis. While the former explains the economic mechanism through which monetary policy influences credit, the latter provides the econometric framework for identifying the critical monetary policy rate beyond which these effects change significantly. Together, these theories provide a robust foundation for examining the nonlinear relationship between monetary policy rate and credit expansion in Nigeria.

Empirical Review

Empirical studies that are related to this study were reviewed. For instance, in the United States, Kashyap and Stein (2000) looked at how monetary policy affects bank lending by using data from commercial banks. Their study found that smaller and less liquid banks cut back on lending more quickly when there is tight monetary policy compared to bigger, well-capitalized banks.

Acha (2011) studied how monetary policy affects the economy in Nigeria using a method called Ordinary Least Squares (OLS). The research showed that monetary policy has a big impact on the economy, but it also found that problems in financial systems can make the policy less effective. One thing missing from Acha’s study is that it only used linear methods.

A year after, Nwosa and Saibu (2012) investigated how monetary policy works in Nigeria by using data from different sectors. They found that tight monetary policy lowers bank lending and private-sector production through the credit channel. However, the study didn't include nonlinear analysis, which is a limitation.

Omankhanlen (2014) used the ARDL method to look at how monetary policy affects the Nigerian economy. The results showed that when interest rates are higher, commercial banks lend and invest less in the long term. One thing that limits this study is that it assumed the effect of interest rates is the same all the time, no matter what kind of policy is in place.

Evans (2017) used a non-linear threshold model to study how interest rates affect financial inclusion in Nigeria from 1981 to 2014. The results found that the interest rate threshold in Nigeria is about 16.9 percent. This means that if interest rates go above 16.9 percent, they make it harder for people to use financial services. But if rates are below that level, their effect on financial inclusion isn't very strong. So, the study shows that high interest rates reduce financial inclusion in Nigeria. The takeaway is that Nigeria and other developing countries with interest rates above 16.9 percent should try to lower rates to help improve financial inclusion through better policies.

Lee (2020) studied the link between bank credit and economic growth using a dynamic threshold panel model for 17 advanced countries. The study found that the relationship between credit and growth follows an inverted U-shape, which means there's a certain level of credit beyond which more credit doesn't help the economy grow. This study is important because it shows that financial relationships can be non-linear and affected by thresholds.

Khan and Senhadji in 2001 used special statistical methods to find out the inflation levels where things change for both rich and poor countries. They found that inflation doesn't hurt much when it's below these levels, but once it goes over, it starts to really slow down economic growth. This study is important because it was one of the first to show how economic factors can have curved or non-linear effects.

Furthermore, Diaz-Roldan Prats and Ramos-Herrera (2021) looked at how changing the way central banks set interest rates could help avoid a situation where rates can't go any lower. They studied the key factors that influence interest rates, like the difference between actual and target inflation and actual and target output. Using a threshold model, they found the points

where these factors switch their effect on interest rates. In the Eurozone, they found that inflation differences always lead to higher interest rates. However, the output difference behaves differently depending on whether it's above or below a certain level, which can lead to lower interest rates, even near zero.

yadeyi (2024) explored how financial development and monetary policy affect the way money moves through the economy in Nigeria. They used data from 1986 to 2023 and a model called NARDL. Their study found that the effects of financial development and monetary policy are not the same in all situations, both in the short term and over the long term. This means that how different parts of the economy respond to changes in monetary policy depends on how developed the financial system is. These results show that the process of money moving through the economy is more complicated than it seems, and that understanding how financial development and monetary policy affect each other is important, especially in different situations. The study also suggests that as financial markets become more advanced, monetary policy might have a bigger effect on the cost of short-term money for banks, but not on how easily businesses and families can get loans. One thing the study didn't do was find the best point at which policy changes should happen, which could be done using threshold regression methods.

Mourphy, Kalu, Ukpere and Anowor (2025) investigated how monetary policy works in different ways to affect credit growth in sub-Saharan Africa (SSA) from 1985 to 2024.They used data from more than 40 countries in the region and applied a method called panel ARDL estimation to study the short and long-term effects of main ways that monetary policy spreads. These include interest rates, exchange rates, asset prices, and credit growth. The study found that credit growth, measured by the value of stocks traded and bank loans to private businesses, is the most important and effective way that monetary policy influences loan growth in SSA countries. Both the interest rate and asset price channels had strong and significant effects on credit growth. However, the exchange rate channel was not as strong in many SSA countries, due to weak financial markets and low responsiveness to exchange rate changes. The research also showed that changes in the way the economy is structured, like focusing on controlling inflation, opening up the financial sector, and giving more independence to central banks, have helped improve

how effectively monetary policy works since the early 2000s.This study is important because it shows that how effective monetary policy is can be different in developing countries.

Moreover, Agbo, Wugo, Gambo, Mbasiti, Yuguda, and Samuel (2025) looked into how the policy rate affects credit given out by banks in Nigeria, focusing on three commercial banks from 2019 to 2023.The goal was to see how changes in the policy rate influence the amount of credit banks provide, considering Nigeria's special economic problems and the rules that govern the banking system. The researchers used a panel linear regression model to look at how the policy rate and credit extension are connected, while also taking into account other big economic factors like inflation, GDP growth, and the exchange rate. Their results showed that changes in the policy rate, GDP, and exchange rate do not have a major impact on bank credit and non-performing loans (NPLs) in Nigeria. This means there are probably other important factors that play a bigger role in affecting how much banks lend and how well loans perform.

Ofoama, Jimba, and Akomolehin (2026) used an Autoregressive Distributed Lag (ARDL) bounds testing method to study how monetary policy tools affect the growth of credit given to the private sector by deposit money banks in Nigeria from 2010 to 2025. The long-term results showed that tools based on liquidity, especially the Cash Reserve Ratio and the general money supply compared to private sector credit, have a strong effect on credit growth. However, the Monetary Policy Rate (MPR) had a negative but not statistically significant effect, which suggests that interest rates aren't passing through effectively in Nigeria's banking system. The findings show that monetary policy works mainly through the liquidity channel, not the price channel. Gap in the study: The research only looked at straight-line relationships and didn't look into whether there are any nonlinear or threshold effects of monetary policy.

Oguche, Olurin and Odutola (2026) looked into how monetary policy tools affect bank credit performance in Nigeria. The Toda-Yamamoto-Dolado and Lutkepohl (TYDL) causation and Autoregressive Distributed Lag (ARDL) methods were used as the major methods. The ARDL results showed that cash reserve ratio, the growth rate of money supply and liquidity ratio have a big effect on DCPS in the long term. However, monetary policy had a negative effect, showing that interest rate tools are not very effective in Nigeria's monetary system. For loan-to-deposit ratio, liquidity ratio and oil prices were important, especially in the short term. The TYDL analysis found both two-way and one-way causality, with cash reserve ratio, growth rate

of money supply, and liquidity ratio being key in how credit is passed through. It was found that increasing money supply causes changes in interest rates and liquidity measures. One thing the study didn't do was estimate endogenous threshold values for the Monetary Policy Rate.

In addition, Boutfssi, Zizi and Quamar (2026) looked at how monetary policy affects bank credit given to the non-financial private sector in Morocco. Morocco is an emerging economy where banks play a big role, and non-financial companies are important for investment, jobs, and economic growth. They used monthly data from 2006 to 2023 and an ARDL-ECM framework that separates short-run credit changes from long-run adjustments while considering possible structural breaks. Their results showed that tightening monetary policy reduced private-sector bank credit both in the short and long run, but the short-run effect was weaker due to the banking sector's difficulty in adjusting quickly. The authors explained that monetary policy transmission through the credit channel works in bank-dominated financial systems, but it depends on the country's institutions and financial markets. This study is important because it shows how effective the bank lending channel is in an emerging economy.

Research Gap

Existing empirical studies on monetary policy in Nigeria have largely examined its effects on economic growth, inflation, exchange rate stability, and bank lending using conventional linear econometric techniques such as Ordinary Least Squares (OLS), Vector Autoregression (VAR), Vector Error Correction Models (VECM), and Autoregressive Distributed Lag (ARDL) models (Acha, 2011; Nwosa & Saibu, 2012; Omankhanlen, 2014; Oyadeyi, 2024). Although these studies have enhanced understanding of the monetary transmission mechanism, they generally assume a linear relationship between monetary policy and credit expansion, implying that changes in the Monetary Policy Rate (MPR) produce constant effects across different policy regimes. This assumption may overlook the possibility that the impact of monetary policy changes once interest rates exceed a critical threshold. To the best of the researcher's knowledge, no recent empirical study in Nigeria has explicitly estimated a Monetary Policy Rate (MPR) threshold using Hansen's (1999, 2000) Threshold Regression Model to identify the critical policy rate at which the effect of monetary policy on credit expansion changes significantly.

Similarly, empirical studies from other countries have increasingly employed nonlinear approaches to examine monetary policy transmission (Khan & Senhadji, 2001; Lee, 2020; Diaz-Roldan Prats & Ramos-Herrera, 2021). However, most of these studies focus on inflation, economic growth, or financial development, while relatively few investigate the threshold effects of monetary policy on private sector credit. Moreover, many international studies rely on cross-country panel data, making their findings less applicable to country-specific monetary policy environments such as Nigeria.

Therefore, there remains a methodological and empirical gap in the literature regarding the estimation of an optimal monetary policy rate threshold for credit expansion in Nigeria. This study addressed this gap by employing Hansen's (1999, 2000) Threshold Regression Model in to estimate the critical monetary policy rate beyond which monetary policy exerts a significantly different effect on private sector credit. By identifying this threshold, the study contributes to the literature on nonlinear monetary policy transmission and provides evidence to support more effective monetary policy formulation in Nigeria.

3.. Materials and Methods

This study investigated the threshold effects of monetary policy on credit expansion in Nigeria using annual time-series data covering the period 1981–2023. The study focused primarily on the Monetary Policy Rate as the threshold variable because it represents the principal policy instrument used by the apex bank in Nigeria to influence short-term interest rates and financial market conditions. Credit expansion is proxied by domestic credit to the private sector as a ratio of GDP in %, reflecting the volume of financial resources supplied by the banking system to productive economic activities. To minimize omitted variable bias, the analysis incorporates relevant macroeconomic control variables, including inflation rate, broad money supply as a ratio of GDP in % and official exchange rate. The data for the study were obtained from the Statistical Bulletin of Nigeria's apex bank.

This study employed discrete threshold regression model based on the framework developed by Bruce E. Hansen (1999, 2000). It allows the effect of the Monetary Policy Rate (MPR) on credit expansion (CX) to differ depending on whether the MPR is below or above an estimated threshold. The model is:

$$CX_t = \beta_0 + \beta_1 CX_{t-1} + \beta_2 INF_t + \beta_3 EXR_t + \beta_4 M3_t + \delta_1 MPR_t I(MPR_{t-d} < \gamma) + \delta_2 MPR_t I(MPR_{t-d} \geq \gamma) + \varepsilon_t \quad (1)$$

Where; CX_t is credit expansion (alternative: private sector credit as a ratio of GDP in %), CX_{t-1} is lagged credit expansion, MPR_t is monetary policy rate, INF_t is inflation rate, EXR_t is exchange rate, $M3_t$ is broad money supply as a ratio of GDP in %, $I(\cdot)$ is indicator function, β_0 is constant term, β_1 is perseverance of credit expansion, β_2 the coefficient of inflation (effect of inflation), β_3 is the coefficient of exchange rate (effect of exchange rate), β_3 is the coefficient of broad money supply as a ratio of GDP in % (effect of broad money supply as a ratio of GDP in %), δ_1 is effect of MPR when MPR is below the threshold, δ_2 is effect of MPR when MPR is above the threshold, γ is unknown threshold value of the monetary policy rate, i.e., γ represents the critical monetary policy rate at which the impact of monetary policy on credit expansion changes. If $\delta_1 \neq \delta_2$, the relationship is nonlinear, indicating that changes in the MPR have different effects on credit expansion depending on whether the policy rate is below or above the estimated threshold and ε_t is error term. The threshold variable divides the sample into two regimes:

$$I(MPR_{t-d} < \gamma) = 1, \text{ if } MPR_{t-d} < \gamma \quad (2)$$
$$0, \text{ otherwise}$$

$$I(MPR_{t-d} \geq \gamma) = 1, \text{ if } MPR_{t-d} \geq \gamma \quad (3)$$
$$0, \text{ otherwise.}$$

The model therefore estimates different effects of the monetary policy rate depending on whether the policy rate is below or above the estimated threshold.

Regime 1: Low Monetary Policy Rate

When $MPR_{t-d} < \gamma$, the model becomes

$$CX_t = \beta_0 + \beta_1 CX_{t-1} + \beta_2 INF_t + \beta_3 EXR_t + \beta_4 M3_t + \delta_1 MPR_t + \varepsilon_t \quad (4)$$

Here, the effect of MPR on credit expansion is measured by δ_1 and this represents the responsiveness of bank credit when the policy rate is relatively low.

Regime 2: High Monetary Policy Rate

When $MPR_{t-d} \geq \gamma$, the model becomes

$$CX_t = \beta_0 + \beta_1 CX_{t-1} + \beta_2 INF_t + \beta_3 EXR_t + \beta_4 M3_t + \delta_2 MPR_t + \varepsilon_t \quad (5)$$

In this regime, the effect of MPR is measured by δ_2 and this captures the impact of monetary tightening on credit expansion.

Descriptive statistics and Augmented Dickey Fuller test (ADF) tests precede the threshold analysis, the Augmented Dickey Fuller test (ADF) was employed to determine if the data is stationary or contains a unit root. The general formula for the ADF test is: $\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \Sigma\alpha_1 \Delta y_i + \delta_t + u_t \quad (6)$

Where: y is a time series, t is a linear time trend, Δ is the first difference operator, α_0 is a constant, n is the optimum number of lags in the independent variables and u is random error term.

4. Results and Discussion

Descriptive Statistics for Underlying Series

This study used descriptive statistics to elucidate the main characteristics of the data. Essentially, the purpose of descriptive statistics is to check if the time series data is stable.

Table 1: Descriptive Statistics for all the Variables

	CX	MPR	M3	EXR	INF
Mean	11.82721	13.05442	15.99326	124.9126	18.77953
Median	8.260000	13.50000	13.13000	125.8300	13.25000
Maximum	20.77000	26.00000	25.16000	465.1900	72.80000
Minimum	5.920000	6.000000	9.150000	0.610000	5.400000
Std. Dev.	5.491636	3.728839	5.589679	129.2888	15.53751
Skewness	0.508169	0.729772	0.431992	1.043230	1.884104
Kurtosis	1.439181	5.065758	1.456741	3.244319	5.895725
Jarque-Bera	6.215473	11.46241	5.604542	7.906635	40.46411
Probability	0.044702	0.003243	0.060672	0.019191	0.000000
Sum	508.5700	561.3400	687.7100	5371.240	807.5200
Sum Sq. Dev.	1266.639	583.9781	1312.270	702055.4	10139.40
Observations	43	43	43	43	43

Note: *CX, MPR, M3, EXR* and INF *as defined previously.*
Source: *Author 2026.*

The descriptive statistics in Table 1 show that during the study period, private sector credit as a percentage of GDP (CX), monetary policy rate (MPR), broad money supply as a percentage of GDP (M3), exchange rate (EXR), and inflation rate (INF) had average values of 11.82721, 13.05442, 15.99326, 124.9126, and 18.77953 respectively. The standard deviation shows that all variables are close to their average, except for the exchange rate. The skewness results show positive values for all variables, meaning they have long tails on the right side. Private sector credit and broad money supply as a percentage of GDP are platykurtic because their kurtosis values, 1.439181 and 1.456741, are below 3. This means they have shorter and thinner tails and lower, broader peaks. Monetary policy rate and inflation rate are leptokurtic with kurtosis values of 5.065758 and 5.895725, which are above 3. This means they have longer and fatter tails and higher, sharper peaks. The exchange rate is mesokurtic, as its kurtosis is about 3, so it follows a normal curve. The Jarque-Bera test shows that the normal distribution hypothesis was accepted for broad money supply as a percentage of GDP, but rejected for private sector credit, monetary policy rate, exchange rate, and inflation rate at the 5% level. This suggests that three of the variables are not normally distributed, possibly due to a unit root issue. As a result, a unit root test for stationarity was conducted, as shown in Table 2.

Table 2: Unit Root Test Outcome via Augmented Dickey-Fuller

Variables	**Level form**		**First difference**		**Order of integration**
	ADF Statistics	**5% Critical Value**	**ADF Statistics**	**5% Critical Value**	
CX	-1.904951	-3.520787	-5.267562	-3.523623	1(1)
MPR	-3.349048	-3.520787	-6.853004	-3.526609	1(1)
M3	-2.309234	-3.520787	-6.137517	-3.523623	1(1)
EXR	0.263461	-3.520787	-5.306409	-3.523623	1(1)
INF	-4.085462	-3.523623	-	-	1(0)

Note: *CX, MPR, M3, EXR* and INF *as defined previously.*
Source: *Author 2026.*

At 5% level, Table 2 reveals that INF is stationary at 1(0). But, CX, MPR, M3 and EXR become stationary after one difference. That is, 1(1). Since the variables are unified of order 1(0) and 1(1), it meets the requirement to use an ARDL model to investigate the long-run relationships.

Table 3: Discrete Threshold Regression Results (Threshold Variable: Monetary Policy Rate) Dependent Variable: Credit Expansion (CX)

VARIABLES	**Regime 1** (MPR < 13%; n = 19)			**Regime 2** (MPR ≥ 13%; n = 24)		
	Coefficient	**t-Statistic**	**Probability**	**Coefficient**	**t-Statistic**	**Probability**
CONSTANT	-4.950223	-2.845940	0.0076	-2.226433	-1.359934	0.1831
MPR	-0.088287	-0.795474	0.4320	0.064068	0.798789	0.4301
M3	1.158089	9.759928	0.0000***	0.735550	6.440402	0.0000
EXR	-0.003235	-0.410924	0.6838	0.003902	0.864514	0.3935
INF	0.006851	0.257015	0.7988	-0.000278	-0.020948	0.9834
R-squared = 0.971865; **Adjusted R-squared** = 0.964192; **F-statistic** = 126.6580; **Prob(F-statistic)** = 0.000000; **Durbin-Watson stat** = 1.584527						

Note: *CX, MPR, M3, EXR* and INF *as defined previously.*
Source: *Author 2026*

The discrete threshold regression identifies a Monetary Policy Rate (MPR) threshold of 13%, indicating that the relationship between monetary policy and credit expansion differs depending on whether the policy rate is below or above this critical value. The sample is divided into 19 observations in the low-interest-rate regime (MPR < 13%) and 24 observations in the high-interest-rate regime (MPR ≥ 13%).

Regime 1: MPR below 13% (MPR < 13%)

The threshold result reveals that when Monetary Policy Rate is below 13%, the coefficient of MPR is negative (-0.0883) but statistically insignificant (p = 0.4320). What this suggests is that monetary policy adjustments below the threshold do not exert a significant direct influence on credit expansion in Nigeria during the study period. Interestingly, broad money supply as a ratio of GDP in % (M3) has a positive and highly significant coefficient (β = 1.1581, p < 0.01). This

implies that a 1% increase in money supply will increase credit expansion by approximately 1.16%, making money supply the primary driver of bank lending when interest rates remain below the threshold. However, the exchange rate (EXR) carries a negative coefficient (-0.0032), suggesting that currency depreciation marginally reduces credit expansion, although the effect is statistically insignificant ($p = 0.6838$). Similarly, inflation exhibits a positive but insignificant coefficient (0.0069; $p = 0.7988$), indicating that price movements have no meaningful effect on credit expansion in the low-interest-rate regime. The intercept is negative and statistically significant ($p = 0.0076$), reflecting the baseline level of credit expansion after controlling for the explanatory variables.

Regime 2: MPR at or above 13% (MPR ≥ 13%)

A careful observation of the threshold result in regime two reveals that once the Monetary Policy Rate reaches or exceeds 13%, the effect of monetary policy changes direction. From the result, the MPR coefficient becomes positive (0.0641) when Monetary Policy Rate reaches or exceeds 13%, but remains statistically insignificant ($p = 0.4301$). Although the sign reversal suggests that further increases in policy rates are associated with slightly higher credit expansion, the lack of statistical significance indicates that this relationship is weak and may simply reflect random variation. Surprisingly, broad money supply as a ratio of GDP in % (M3) continues to exert a strong positive and highly significant influence on credit expansion ($\beta = 0.7356$, $p < 0.01$). However, its coefficient is smaller than in the low-interest-rate regime (0.7356 compared with 1.1581), suggesting that the effectiveness of monetary expansion in stimulating credit declines once policy rates exceed the threshold. The exchange rate becomes positive (0.0039) but remains statistically insignificant ($p = 0.3935$), while inflation turns marginally negative (-0.0003) and is likewise insignificant ($p = 0.9834$). Thus, neither exchange rate movements nor inflation significantly influence credit expansion in the high-interest-rate regime. The constant term is not statistically significant ($p = 0.1831$).

The model explains approximately 97.2% of the variation in credit expansion ($R^2 = 0.9719$), while the adjusted R^2 of 96.4% confirms an excellent fit after accounting for the number of explanatory variables. The overall model is highly significant, as indicated by the F-statistic of

126.658 ($p < 0.001$), demonstrating that the explanatory variables jointly account for variations in credit expansion. The Durbin–Watson statistic of 1.58 suggests no evidence of severe positive serial correlation, although it is slightly below the ideal value of 2, indicating that further diagnostic testing (e.g., the Breusch–Godfrey serial correlation test) could be performed to confirm the absence of autocorrelation.

5. Conclusion and Recommendations

This study carefully investigated the threshold effects of the Monetary Policy Rate (MPR) on credit expansion in Nigeria using Hansen's (1999, 2000) Discrete Threshold Regression framework over the period 1981–2023. The empirical results identified an MPR threshold of 13%, confirming that the relationship between monetary policy and credit expansion is regime-dependent. However, the estimated coefficients indicate that the direct effect of the MPR on credit expansion is statistically insignificant in both the low rate (MPR < 13%) and high rate (MPR ≥ 13%) regimes. The findings further reveal that broad money supply (M3) is the only variable that consistently exerts a positive and statistically significant influence on credit expansion across both regimes, although its effect is stronger when the MPR is below the estimated threshold. In contrast, exchange rate and inflation do not have statistically significant effects on credit expansion.

These results suggest that liquidity conditions, rather than changes in the policy rate alone, constitute the principal channel through which monetary policy influences credit expansion in Nigeria. Importantly, the study has demonstrated that the effectiveness of monetary policy depends on the prevailing policy regime and highlights the usefulness of threshold models in capturing nonlinearities that conventional linear models may overlook. Based on the empirical findings, the study recommends that the apex bank in Nigeria should complement Monetary Policy Rate adjustments with effective liquidity management measures, given that broad money supply exerts a stronger and more consistent influence on credit expansion than the policy rate itself. In addition, monetary policy decisions should incorporate the estimated 13% MPR threshold as an analytical reference point when assessing the potential impact of policy changes on credit expansion. The threshold should inform policy analysis rather than serve as a fixed operational target. The head bank in Nigeria should maintain adequate liquidity in the banking

system through appropriate monetary operations while ensuring consistency with its price stability objective, thereby enhancing the transmission of monetary policy to the real sector. Government and financial sector regulators should implement complementary structural reforms that improve financial intermediation and reduce constraints to bank lending, since changes in the policy rate alone are insufficient to stimulate credit expansion.

Future research should extend this analysis by employing alternative nonlinear models, such as Threshold ARDL or Smooth Transition Regression, to examine whether monetary policy thresholds differ across sectors or over different monetary policy regimes.

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